

# Hawaii Solar Update

US EPA Innovative Energy Management Workshop  
Oahu & Kaua'i  
February 2010

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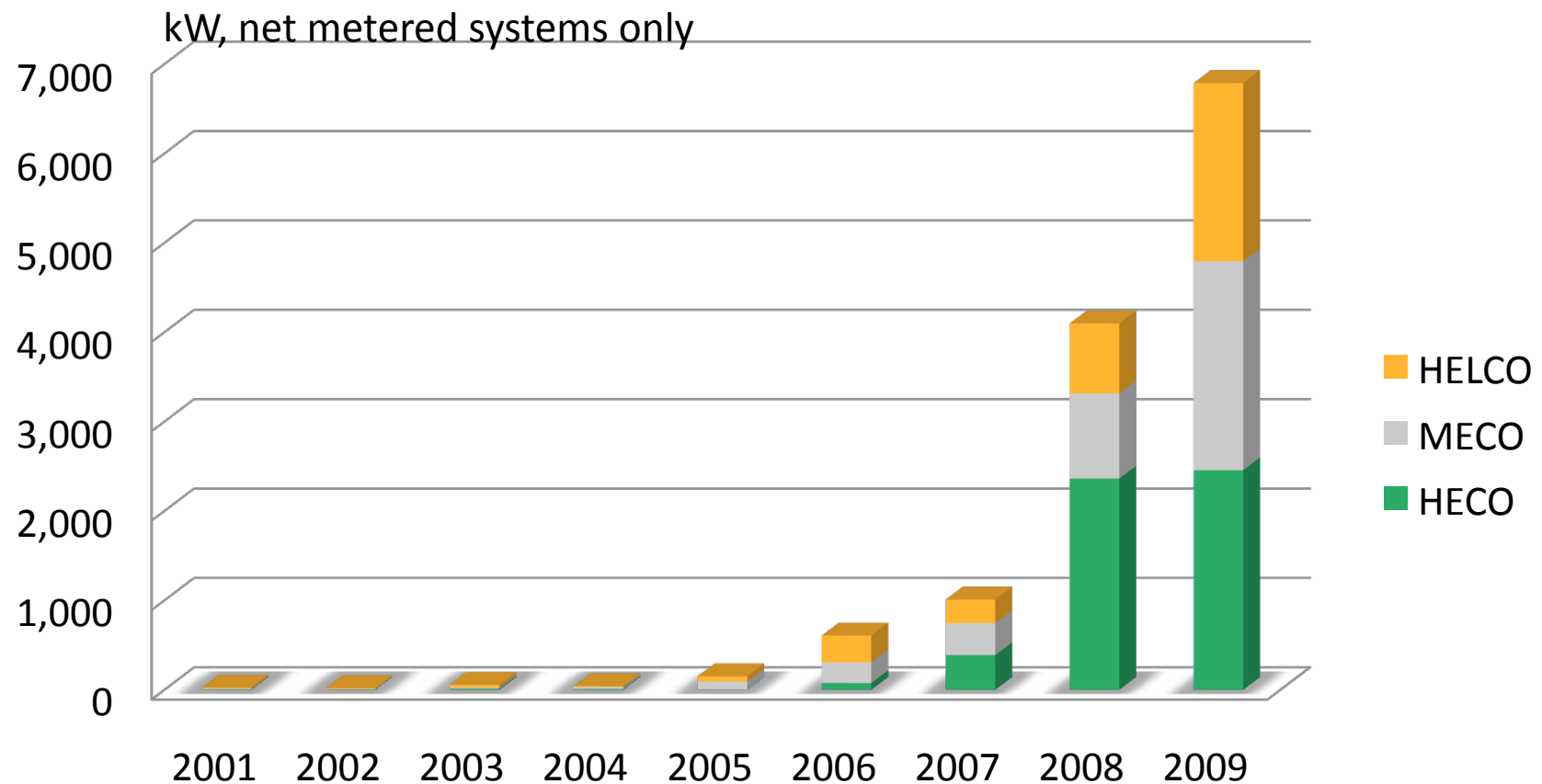


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## Section 1

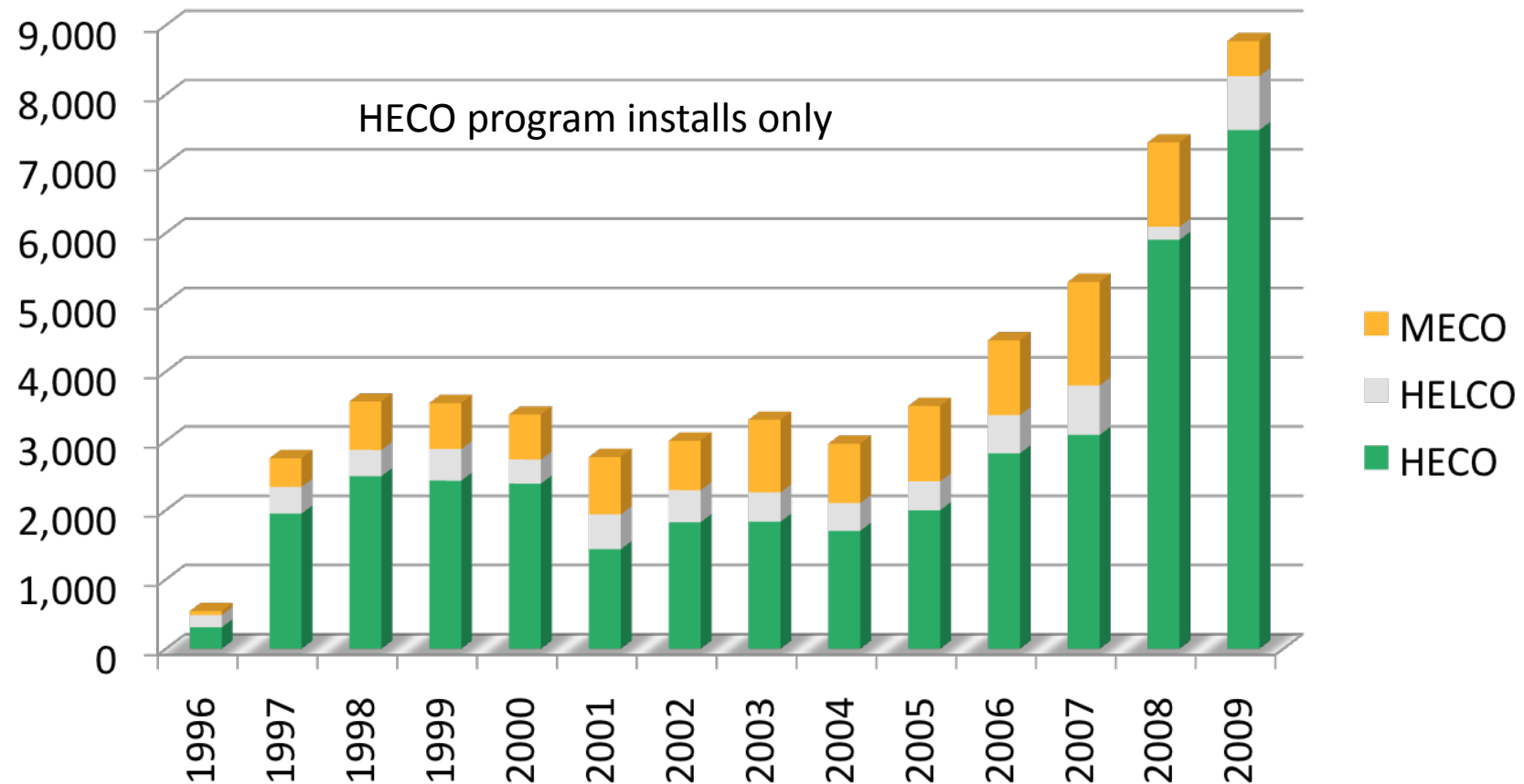
# SOLAR MARKET OVERVIEW

# PV Growing Despite the Downturn



Source: HECO Companies Net Energy Metering Annual Status Report 2009.

# Solar Hot Water Installs up 196% from 2004-2009

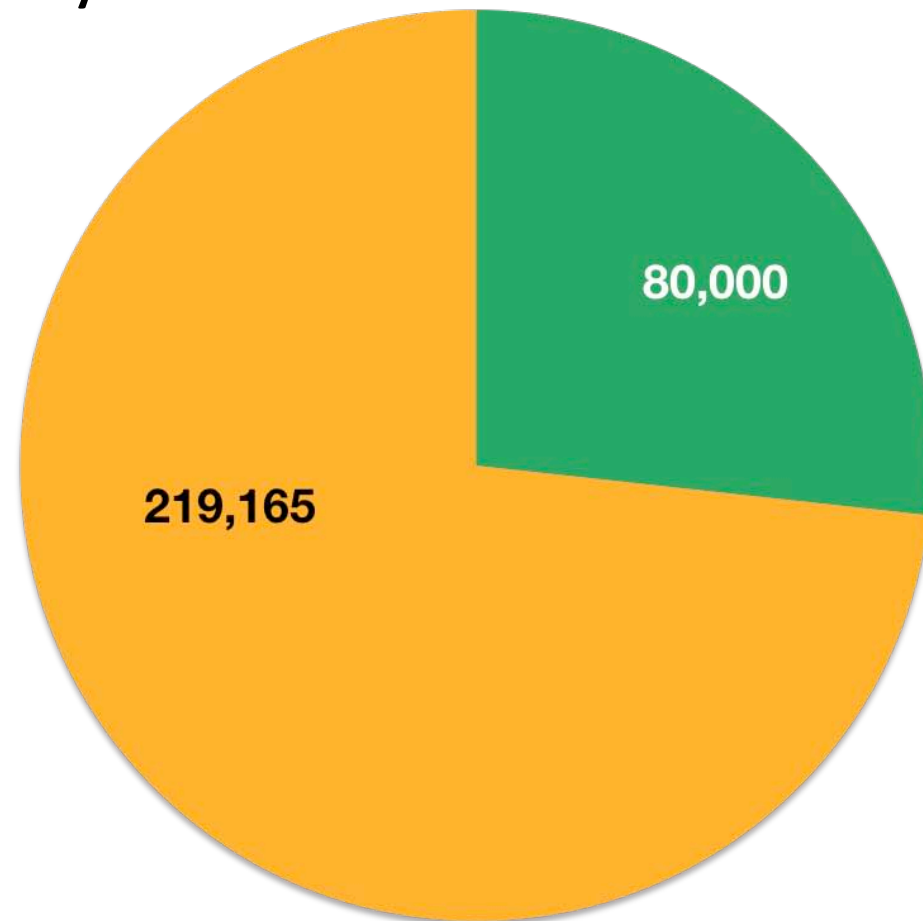


# Solar Hot Water Penetration

Roughly 25 percent of single family homes

■ Solar Water Heating System

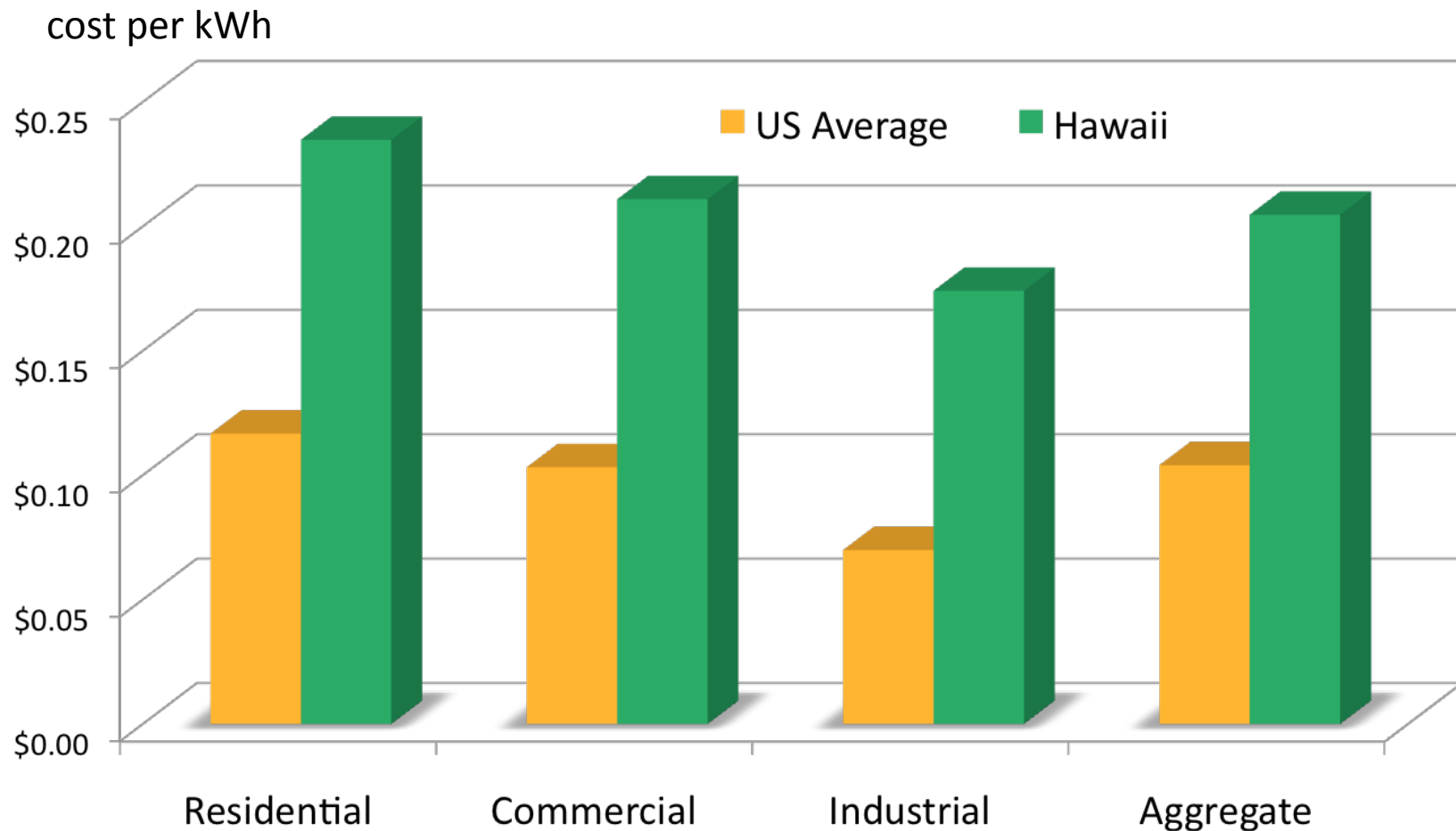
■ Remaining Single Family Housing Units



Note: Total is based on number of combined single-family attached and detached homes.

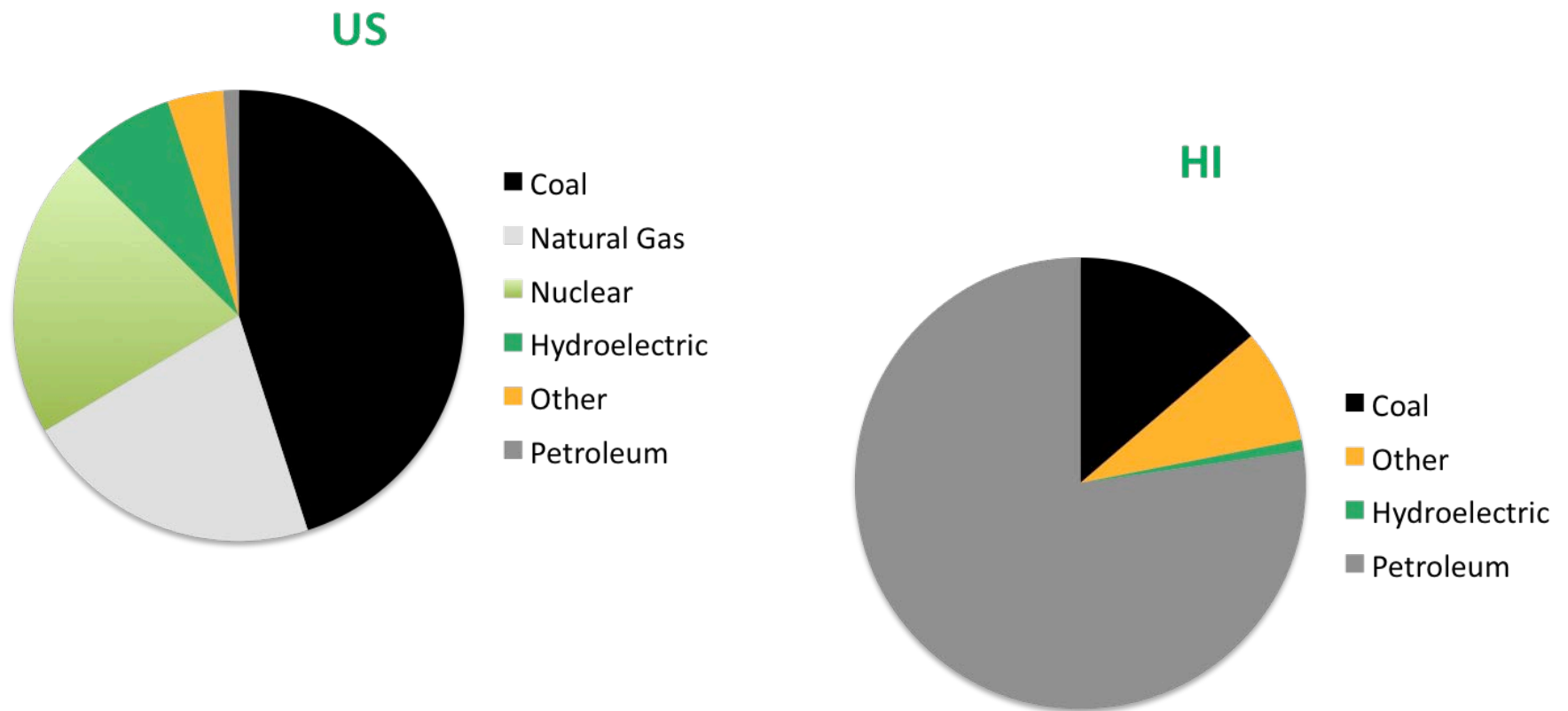
Source: US Census , American Community Survey, three year estimates for 2007; HECO Companies press release, June 4<sup>th</sup>, 2009.

# Grid Power is Expensive in Hawaii



Source: USDOE Energy Information Administration, Average Retail Price to End User, December 2009 release (data for Sept 2009).

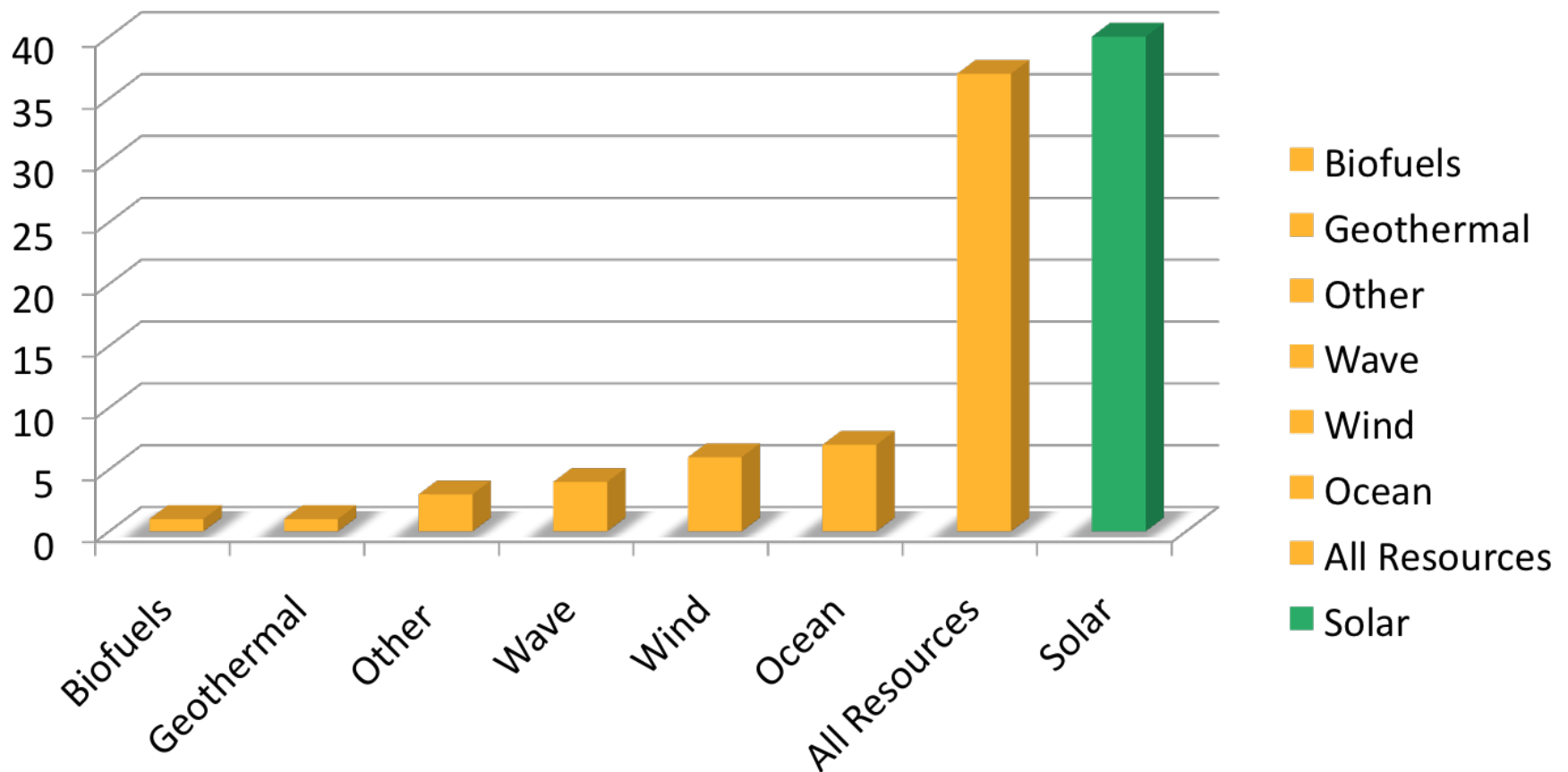
# Energy Supply Vulnerability Cannot be Overstated



Source: USDOE Energy Information Administration, Electric Power Industry Generation by Primary Source (as of 2007).

# Hawai'i Residents Prefer Solar

## Which Source of Clean Energy Is Best for Hawai'i?



Source: Blue Planet Foundation Survey of Hawai'i residents, N=403, Nov-Dec 2008.



# Drags on Growth in 2009

- Credit markets
- Business confidence
- Grid access
- Other signs are strongly positive

## Section 2

# SOLAR INCENTIVES

# Federal Legislation

- *Energy Policy Act of 2005*
  - raised federal solar investment tax credit (ITC) from 10% to 30%
- *Emergency Economic Stabilization Act of 2008* (“Bailout Bill”)
  - extended solar investment tax credit to 2016
- *American Reinvestment & Act of 2009* (“Stimulus Bill”)
  - made credit available in form of a grant in 2009-2010 (for commercial only)
  - 60 day payout for commercial only

# Current State of Hawaii Tax Policy

- HRS Section 235-12.5 Renewable Energy Technologies Income Tax Credit (RETITC)
  - Option 1: 35 percent of installed cost; non-refundable
  - Option 2: 24.5 percent of installed cost; refundable
  - Option 3: 35 percent of installed cost; refundable (only for very low-income (<\$20,000 AGI) or pension-only)
- MACRS depreciation - ‘five year property’
  - basis is installed cost

# MACRS: Federal and State

Depreciation Schedule	
Year 1	20.00%
Year 2	32.00%
Year 3	19.20%
Year 4	11.52%
Year 5	11.52%
Year 6	5.76%

- Depreciable basis is installed cost less half of federal tax credit for federal (currently 85% of installed cost).

# Solar Water Heating

- Same state and federal incentives as PV
- “Mandate” kicks in for new homes permitted after December 31, 2009 (loophole allows compliance with gas)
- Ratepayer funded rebate declining
  - Ends for new construction January 1, 2010 but homes permitted in 2009 can still receive rebates until March 2010
  - Reduced from \$1,000 to \$750 February 1, 2010

# Regulatory Policy: NEM and FIT

## NEM

- 'Store' electrons in the grid for later use
- Accounting based on kWh credits, not dollars
- Applies only to systems < 100 kW (in rough terms \$3,000/mo. power bill on Oahu)
- Capped at 1% (roughly 12 MW) HECO or 4% (roughly 8 MW) MECO & HELCO of peak demand
- Only credited up to annual kWh used

## FIT

- Higher system size caps than NEM
- Accounting in dollars not kWh
- Applies to systems up to 5 MW
- Capped at 5% of peak demand (HECO: 60 MW, MECO/HELCO: 10 MW)
- Not linked to load at site

# Summary

- NEM & FIT serve different needs in the market
  - NEM is for management of operating costs
  - FIT involves getting into the energy business
  - Risks and rewards are different
- Currently customers needing more than 100 kW can must either:
  - install 100 kW systems
  - size system above 100 kW but never export power
  - negotiate with utility for purchase of excess power
- Rules make it difficult to offset larger loads with PV





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## Section 3

# INTERCONNECTION

# Rule 14H

Additional technical study may be needed based on:

1. Complexity of the portion of the grid system is being interconnected to
2. Connection to a network system
3. Plan to export power
4. Feeder penetration > 10%
5. Starting voltage drop
6. Generating facility capacity
7. Short circuit contribution ratio >5%
8. Type of interface transformer

Source: Rule 14, Appendix III, Sheet 34D-8 and 34D-9.

# Challenges of Interconnection Study

- Cost to developer of existing studies has been \$30,000-\$100,000
- Time frame >6 months (typically shifts placed-in-service tax year)
- Outcome can be purchase of equipment to interconnect the system

# Challenges: NEM & Interconnection

HAWAII					
NET METERING			INTERCONNECTION		
C	C	C	F	F	F
2007	2008	2009	2007	2008	2009
Eligible Renewable/ Other Technologies:	Photovoltaics, Wind, Biomass, Hydroelectric, Small Hydroelectric		Eligible Technologies:	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/ Cogeneration, Microturbines, Other Distributed Generation Technologies	
Applicable Sectors:	Commercial, Residential, Local Government, State Government, Fed. Government		Applicable Sectors:	Commercial, Industrial, Residential, Nonprofit, Schools, State Government, Fed. Government	
Limit on System Size:	100 kW for HECO, MECO, HELCO customers; 50 kW for KIUC customers		Limit on System Size:	No limit specified	
Limit on Overall Enrollment:	3% of utility's peak demand for HELCO and MECO; 1% of utility's peak demand for KIUC and HECO		Standard Interconnection Agreement?	Yes	

Source: Freeing the Grid: Best and Worst Practices in State Net Metering Policies and Interconnection Standards. November 2009.



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## Section 4

# FUTURE

# Future Issues/Trends

- Rising costs of grid power due to: oil price trends; cost recovery on infrastructure for smart grid; carbon pricing schemes
- End of federal grant option in 2010
- Continued module availability but with increasing demand
- Continued grid access challenges

# Thank You

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